



MUTE SWAN ISSUES IN MICHIGAN

MICHIGAN DEPARTMENT OF NATURAL RESOURCES WILDLIFE ISSUE REVIEW PAPER 12

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The mission of the Wildlife Division of the Michigan Department of Natural Resources (DNR) is: To enhance, restore, and conserve the State's wildlife resources, natural communities, and ecosystems for the benefit of Michigan's citizens, visitors, and future generations. Implicit in this mission statement is the goal of maintaining viable populations of native wildlife species and conserving wildlife habitat. An important function of the DNR is to provide information to the Natural Resources Commission (NRC), stakeholders, and the public concerning policy and management procedures for wildlife species. All policies and procedures are developed with consideration of the biological and social effects of proposed management and are based on the best available scientific information.

ISSUES

Feral mute swans (*Cygnus olor*) have the potential to cause wildlife management problems in the form of human-swan conflicts in Michigan and other areas where populations become established. Mute swans aggressively defend their nesting territories against intrusion and therefore can outcompete native wildlife such as ducks, common loons (*Gavia immer*), and trumpeter swans (*Cygnus buccinator*). Mute swans also have the potential to endanger public health, safety and welfare. Although these swans are detrimental to native wildlife (Johnson 2001, Williams 1997) and are sometimes considered a nuisance, they are popular with many citizens who enjoy viewing and feeding them.

Concerns over the expanding population of swans were first expressed by the DNR in the 1960s and continues today. This report outlines the history of the mute swan in Michigan and examines the biological and social issues involved in their management.

BACKGROUND AND DISCUSSION

HISTORY OF MUTE SWANS IN MICHIGAN

Mute swans are native to Eurasia and are an exotic (non-native) species in North America (Bellrose 1980). These swans were introduced to this continent in the mid-1800s to adorn city parks and large estates. All North American mute swan populations originated from the release or escape of individuals from these early captive flocks (Ciaranca et al. 1997). Since being introduced to this continent, feral mute swan populations have become established in all four waterfowl management flyways, including the Great Lakes Region of the Mississippi Flyway. Population surveys indicate that mute swans continue to increase in number and are expanding their distribution in the Mississippi Flyway.

The first pair of feral mute swans was introduced to Michigan in 1919 near Charlevoix (Wood and Gelston 1972). The population has continued to grow since that time. By the mid 1940s the flock had increased to 47 (Wood and Gelston 1972). These swans spread through northern lower Michigan. In 1972, the flock near Traverse City numbered between 450-500 birds (Gelston and Wood 1982) and was increasing at 15-22% annually. The population in northern lower Michigan was over 1,000 birds by 1982 with over 2,000 birds statewide by 1990 (Gelston and Wood 1982, Michigan DNR unpublished data).



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The mute swan population in Michigan is tracked twice yearly by the Michigan DNR. The first survey is the mid-winter waterfowl count conducted in early-January. Because this effort includes traditional wintering areas and does not represent complete coverage, it is more of an index to population change. The mute swan population is also monitored each spring during the Michigan Breeding Waterfowl Survey (Table 1). The systematic aerial coverage of 2,500 miles of transects across the state provides an actual population estimate. However, mute swans are not distinguished from other swans in this effort. Although each of these surveys counts swans by a different method, at a different time of the year, they both indicate an increasing population of mute swans (Figure 1). The trend information indicates a population that could be on the verge of exponential growth.

The statewide breeding population was estimated as high as 7,116 in 1999 and was 6,503 swans in 2003. Despite the annual variation in these population estimates, both estimates have been consistently higher than long-term (year 2030) population goals of 2,500 mute and trumpeter swans combined, set by the Michigan DNR in 1998 (Michigan DNR 1998).

BIOLOGICAL ISSUES

POPULATION GROWTH

Mute swan populations have the potential to increase rapidly if unchecked. In Maryland, the mean annual rate of population increase was 36% from 1962-78. From 1986 to 1999 the total population in the region increased by 1398% (Maryland Dept. of Natural Resources 2001). Population estimates from the Mississippi Flyway also show rapid growth although it is not as dramatic as on the east coast. Nelson (1997) estimated 3,600 wild and 1,000 captive mute swans in the Mississippi Flyway in 1996. These numbers were updated in 2000 to 5,700 wild and 1,100 captive mute swans in the flyway. Mid-winter inventories of mute swans in the Mississippi Flyway indicate an average annual increase of 10% between 1991 and 2000 (Johnson 2001). However, the Michigan population has had a slower growth rate (Figure 1). As the population has grown, the birds have expanded their distribution throughout the region (Johnson 2001). Mute swans are relatively long lived, which contributes to their population growth. In Michigan, mean annual mortality rates of fledgling through 3 year old swans ranged from 12-16% a year. From ages 4-8 years, annual mortality decreased to 2-7% per year. At age five, annual mortality averaged only 2% (Gelston and Wood 1982). Although essentially non-migratory, survival rates remain high through winter because the swans move to warm water discharges and rivers.

EFFECTS ON HABITAT

Mute swans feed primarily on submerged aquatic vegetation (SAV). Research in Chesapeake Bay revealed the species was herbivorous throughout the year. Principal food items included widgeon grass (*Ruppia maritima*), which made up 66-78% of their diet, and eel grass (*Zostera marina*) which made up 2-32% of their diet. Other SAV and invertebrates made up only 1% of their diet and invertebrates were only thought to be ingested incidentally while consuming SAV (Maryland Dept. of Natural Resources 2001). Adult swans consume 4-8 pounds of plant material each day. Fecal analysis of Chesapeake Bay mute swans showed 81.8% SAV and only 0.3% animal matter (Fenwick 1983). In summer, mute swans consume SAV where it is readily available. By feeding heavily on this food source, mute swans reduce the availability of SAV to native wildlife. In Maryland, the mute swan population consumes about 9 million pounds of SAV annually and may overgraze aquatic grasses eliminating habitat for other wetland species. In the Chesapeake Bay region, overgrazing of SAV is a concern among biologist because heavy grazing can reduce the reproductive success of these plants, reducing the abundance of macroinvertebrates that depend on these plants for food and shelter (Engel 1990).

Several studies on aquatic plant depredation by mute swans have been conducted in eastern states (Cobb and Harlan 1980). Researchers have found selective foraging by swans can alter plant community composition (Krull 1970). Further, swan foraging is competitive with other native wildlife, and can be damaging to aquatic plant resources (Johnson 2001). While plant depredation

has not been extensively documented in Michigan, mute swans may consume large quantities of aquatic vegetation, thereby reducing the availability of certain wetland plants, and may ultimately reduce the carrying capacity of wetlands for native wildlife species. However, because it is unknown which submerged plant species are the primary forage of mute swans in the Great Lakes region, it is difficult to predict the full effects of this species on other fish and wildlife species or their habitats.

Swans are frequently fed supplementally by humans, either by waterfront property owners or at public waterfronts. Corn is frequently fed and can supplement limited winter foods. This may enable many mute swans to survive extreme winter conditions (Bellrose 1980).

SPECIES INTERACTIONS

Mute swans exhibit aggression toward other waterfowl and can displace native waterfowl through attacking, injuring, and even killing other birds (Willey 1968, Stone and Marsters 1970, Kania and Smith 1986, Ciaranca 1990). The level of interspecific antagonism varies among breeding pairs and seasonally. Interspecific aggression reaches a peak during the breeding and brooding season (Ciaranca 1990, Anderson and Titman 1992) as male swans defend their nesting territories or young cygnets. In a Rhode Island study, one pair of mute swans defended a 5-acre pond and prevented its use by other waterfowl. In New York, three pairs of captive mute swans killed at least 50 ducks and geese on a zoo pond (New York State Department of Environmental Conservation 1992). In Maryland, there are records of mute swans killing mallard ducklings, Canada goose goslings and cygnets of other mute swans (Maryland Department of Natural Resources 2001).

Mute swans are not always aggressive towards other species within their nesting territories. On Belle Isle, a Detroit city park, mute swans and Canada geese tolerated nesting in close proximity (P. Squibb, Michigan DNR, Lansing, personal communication). However, a large molting flock of Maryland mute swans caused a colony of least terns (*Sterna antillarum*) and black skimmers (*Rynchops niger*) to abandon their nesting colony by trampling nests containing eggs and chicks. These swans also displaced nesting Forster's (*Sterna forsteri*) and common terns (*Sterna hirundo*). Mute swans have also been observed exhibiting aggression toward tundra swans (*Cygnus columbianus*) (Maryland Dept. of Natural Resources 2001).

SOCIAL ISSUES

LEGAL STATUS IN MICHIGAN

The Michigan DNR is the state agency responsible for managing wildlife resources in the state and has authority to set regulations concerning the management of wildlife species. Michigan law classifies mute swans as a protected species. Their legal status is addressed in a state Wildlife Conservation Order.

Chapter IX -- Protected and Unprotected Animals. History: Eff. Mar. 31, 1989; Am. 9, 1989, Eff. Sept. 1, 1989; Am. 3, 1993, Eff. June 15, 1993; Am. 4, 1999, Eff. Apr. 9, 1999; Am. 1, 2000, Eff. Feb. 1, 2000., Interim Order 2, 2002, Eff. July 13, 2002; ; Interim Order 1, 2003, Eff. Jan. 14, 2003.

Sec. 9.1. Permitted acts; certain species.

(2) Mute swans may be taken by department personnel, and persons may be authorized in writing by the department to control mute swans by means other than shooting, under 1 or more of the following situations:

- (a) To stabilize mute swan population levels or to prevent new populations of feral mute swans from being established in this state.
- (b) To prevent mute swans interference with the establishment, reestablishment, or reproductive success of native wildlife.
- (c) To prevent mute swans interference with the establishment, reestablishment, or reproductive success of endangered or threatened species.

(d) To protect public health, safety, or welfare.

(3) Mute swans taken as provided in this section shall not be released back into the wild in this state. Mute swans rendered and certified incapable of reproduction and flight by a licensed veterinarian may be converted to private ownership at that private owner's expense.

Sec. 9.3. Protected Animals; unlawful acts.

(1) Moose and all birds not defined as game, except those listed in section 9.1, shall not be taken at any time.

(2) Mute swans and bats shall not be taken at any time except as specified in section 9.1.

Since July 12, 2002, the Michigan DNR has been operating under an Interim Order of the Director. This order was necessary to bring state regulations regarding nuisance mute swan control into consistency with a recent federal court interpretation of the Migratory Bird Treaty Act and attendant federal regulations. State regulations may be more restrictive but not more liberal than federal law. This Interim Order, which was approved for a six month period, was enacted to enable Michigan to continue to operate under regulations consistent with current federal interpretation and grant the Department the opportunity to fine-tune orders for NRC consideration later in 2003. The Interim Order was renewed for an additional six month period on January 10, 2003 and is due to expire again on July 12, 2003.

The Interim Order provided for the establishment of a joint federal-state mute swan nuisance control permit. Although the permit processing changed, permits are issued under regulations fairly consistent with previous state rules. State regulations continue to prohibit issuance of a permit which would allow the release of mute swans back into the wild in Michigan. Previous state regulations provided for a blanket conversion of nuisance birds to be private property following pinioning and sterilization. As a migratory bird under federal law, conversion to private property is no longer a blanket option and would require the receiving party to have been issued an appropriate federal permit unless the receiving party is a state game agency, municipal park, public museum or zoological park, or a public scientific or educational institution and complies with federal reporting requirements.

Amendment No. 1 of 2003 to the Wildlife Conservation Order under 9.1 Permitted acts; certain species.

(2) Mute swans may be taken as provided by a federal depredation permit if the federal depredation permit is countersigned by a state wildlife biologist. A state wildlife biologist shall not countersign a federal depredation permit if the federal depredation permit allows a mute swan to be released back into the wild in this state. A countersigned federal permit shall be a federal-state depredation permit. A person issued a federal-state depredation permit shall be considered a person issued a damage and nuisance animal control permit as described by sections 5.50 and 5.51 of this order and shall take and dispose of mute swans only as provided by the federal-state depredation permit.

FEDERAL LEGAL STATUS

The U.S. Fish and Wildlife Service (USFWS) considers this species to be a serious threat to the ecological integrity of many areas that are managed for natural wildlife diversity. Additionally, in March of 1998, the USFWS directed all National Wildlife Refuges to control mute swans on these areas (Gould 1998).

The Atlantic Flyway Council adopted a mute swan policy in 1997 that encouraged state wildlife agencies to control mute swans in the Atlantic Flyway. Until recently mute swans were not protected by the Federal Migratory Bird Treaty Act of 1916 and did not receive federal protection. This was because mute swans were not endemic to North America. On 28 December 2001, a federal appeals court (U.S. Court of Appeals for the D.C. Circuit, which has jurisdiction over

federal agencies) ruling gave mute swans protection under the Migratory Bird Treaty Act. The organization Save Our Swans USA, argued that when Congress ordered the federal government (referring to the Migratory Bird Treaty Act) to protect "wild ducks, geese and swans," that included mute swans. Initially, the case lost in federal trial court (District Court), but the three-judge appeals panel said it was "plain" that mute swans are swans, and therefore must be protected under the federal act. The panel said the federal government can, within the limits of the migratory bird law, take steps to control the damage done by mute swans, including possibly hunting, capturing or killing them.

The following excerpts of the description of the courts ruling and analysis was provided by Ellen Paul, Executive Director of The Ornithological Council.

"The court stopped short of ruling definitively that the Department of the Interior must protect Mute Swans (i.e., include them on the list of species covered by the Migratory Bird Treaty Act) although the court's language certainly suggests that this should be the case. Instead, the court based its ruling on the fact that the DOI has never explained why this species should not be included. The court noted that the language of the treaties underlying the MBTA (which of course differ from one another) refer specifically to swans or Anatidae, without excluding non-native species. At one time, the DOI regulations implementing the MBTA specified that species added to the list must be "indigenous" but that criterion was dropped two years later, in 1967. In 1984, the USFWS modified the criteria again: it proposed to "[a]dd species that are of regular occurrence in the United States that were not included on the last List," and also to "[d]elete species whose occurrence in the United States is deemed accidental, i.e., the U.S. is outside the species' normal range and occurrence is infrequent and irregular."

The Administrative Procedure Act requires that federal agencies support their decisions with a factual basis and a record of the decision-making process. If the agency meets the requirements of that law, then the courts give "great deference" to the agency decision. However, in this case, there was no record of a decision-making process. The decision issued by the court says, "In fact, the agency record in this case is utterly silent on any basis, let alone any reasonable basis, to support the exclusion of mute swans from the List of Migratory Birds." Although the attorneys for DOI offered several arguments supporting the reasonableness of the mute swan's exclusion from the List of Migratory Birds [the mute swan is not a native species, the mute swan's aggressive and territorial nature causes harm to other protected species and habitats, and extending protection to the mute swan might affect other treaty obligations of the United States and statutory obligations of the Secretary], "We have no idea whether these arguments are pertinent, and, if so, whether they are compelling. It does not matter, however, for we do not assume that the arguments of counsel are the same as the Secretary's official position. And, it is well understood that "[t]he courts may not accept appellate counsel's post hoc rationalizations for agency action."

As noted above, the court didn't force the DOI to include Mute Swans on the MBTA list. The DOI can respond [among other alternative actions], by establishing policies, supported by facts and a record, to determine whether Mute Swans should be included. (This policy could be limited to Mute Swans or could be extended to include other non-native species). Of course, the policy itself could still be challenged (through the public comment process if the DOI chooses to formalize its policy in regulation; and through the court system). Despite the court's reiteration of the "great deference" policy, this particular court has suggested that the DOI would have a hard time convincing the court that the law permits the exclusion of Mute Swans. The decision says, "We do not mean to say, however, that the Secretary can overcome the apparent plain meaning of the statute and the treaties if and when the Secretary offers an explanation for the List of Migratory Birds." Other

alternatives include an appeal to the Supreme Court, or inclusion of Mute Swans on the MBTA list, with permits issued to states for control of the species.”

HUMAN INTERACTIONS

Mute swans are large, conspicuous birds and have little fear of humans. They are easily observed by the public and offer a chance for people to come in close contact with wildlife. In England, swans were considered property of the British Crown and thus for centuries, swans have symbolized beauty, royalty, and wealth. Some people raise mute swans in captivity. In Michigan, 90 people have permits that allow them to keep mute swans, of which 18 are categorized as commercial operations. There were a total of 353 mute swans in captivity in Michigan at the time of this report (J. Janson, Mich. DNR, unpublished data).

Nesting swans can be very aggressive to humans that enter their territory. Mute swans will attack humans, especially small children who get too close to their nest or young. Canoeists and persons operating personal watercraft have also been attacked when too close to mute swan territories. Mute swans are aggressive and may pose a danger to humans and can in certain situations effect human use of property when humans are excluded from nesting areas by swans defending their territories.

BIRD STRIKES

Large birds, such as mute swans, present a significant threat to aviation. Birds can collide with airplanes and cause serious structural damage to planes and may cause them to crash. The damage can be extensive and quite expensive. However, the worst case scenario is the loss of human lives.

A query of the National Wildlife Strike Database revealed that there were 7 bird strikes to civil aircraft involving swans nationwide from 1990-2001 (Dickey and Newman 2003). One of the collisions was in Michigan and resulted in an aircraft being out of service for 36 hours for repairs after it struck multiple mute swans. There may have been additional swan bird strikes that went unreported. It is believed that the voluntary reporting of bird strikes significantly underestimates the magnitude of the problem (Cleary et al. 2002). Fortunately, in Michigan, no crashes due to swan strikes have been reported to date.

ECONOMIC LOSS

Economic loss is difficult to assess. Losses are primarily ecological and involve the loss of biodiversity that occurs when native species are displaced by swans. In addition, there is an “opportunity cost” for conservation agencies. This cost includes wildlife habitat management, population inventory, public outreach, and other important conservation activities that are not accomplished by agency staff due to the growing time and resources that must be dedicated to mute swan issues.

MUTE SWAN MANAGEMENT STRATEGIES

Natural mortality is relatively low among mute swans (Gelston and Wood 1982). Annual mortality is about 2% among adult mute swans, therefore their population size is primarily influenced by recruitment of young into the population and adult annual survival rate (Maryland Dept. of Natural Resources 2001). Aggressive production control measures such as egg addling and nest destruction have the potential to slow population growth, but in Maryland and Rhode Island these practices have not caused a reduction in the mute swan population (Maryland Dept. of Natural Resources 2001). Instead, the most effective control is to change the adult annual survival rate. No state currently holds a hunting season that targets mute swans exclusively, however they may be harvested in some states during legal tundra swan seasons. Several states (Pennsylvania, Delaware, Vermont, Virginia) offered them no protection until the 2001 change in Federal legal status. Each state has their own policies regarding mute swans, including rules for taking, possessing, and breeding. In Michigan, mute swans are protected by state laws, and the DNR has

regulatory control over them under permit from the USFWS. A draft management plan, which allows lethal control by permit, is being used. Most states with mute swan populations had taken the position that this species is harmful to native wildlife, people, and wildlife habitat and have some control measures in place to limit their population size, although now the species is governed by Federal law.

EDUCATION

The general public's perception of mute swans is of a graceful, beautiful bird and most people are unaware of the problems related to their presence in native wildlife habitat. The public should be made aware of native swan populations and the potential threat of mute swan expansion to native wildlife species. The USFWS noted that an outreach effort to increase public awareness should be an integral part of their policy to control numbers of mute swans on the lands that they administer (Gould 1998). In Maryland, a public awareness campaign has been started in an effort to educate people of the population status and effects of mute swans on their environment (Maryland Dept. of Natural Resources 2001).

SUMMARY

The mute swan population in Michigan was established in the early part of the 20th Century; by the 1990s it had reached a wintering population of at least 2,000 birds--the largest feral population in the Mississippi Flyway. Recent statewide surveys estimate populations of >6,000 swans (mostly mute swans), which is three times greater than statewide population goals established in 1998. Feral mute swans have the potential to cause wildlife management problems in the form of human-swan conflicts and effects on native wildlife species. Mute swans are long-lived species, having few natural predators, and may increase rapidly in number if not controlled. The Atlantic Flyway populations have increased dramatically in recent years and Michigan's population has the potential for continued growth. High populations of mute swans have the potential to negatively affect their habitat by over-grazing submerged aquatic vegetation. Additionally, they may outcompete native wildlife species such as loons, ducks and geese. Despite the ecological problems associated with mute swans, they remain popular with a portion of the public who are unaware or unconcerned with the negative aspects of mute swans.

Until recently, mute swans were unprotected by the Federal Migratory Bird Treaty Act (MBTA), but were afforded protection in Michigan. As a result of recent federal court rulings, the status of mute swans in Michigan has been modified to reflect joint federal state regulation of swans under the MBTA. Now this species is covered by the MBTA, but its status in Michigan is in a state of flux. As federal interpretation of case law becomes established, Michigan's regulations covering these birds can be expected to change. Management strategies in Michigan must be reestablished in response to an increasing population. Policies and procedures also need to be updated in light of regulatory changes. Management plans must be updated to address population goals, distribution of population, and an increasing population of native trumpeter swans. Further efforts should be directed at the public to educate them on the negative aspects of high mute swan populations.

Table 1. State swan population based on the Michigan breeding waterfowl survey conducted between 20 April and 10 May, 1992-2003. Estimated are primarily mute swans, but may include some trumpeter swans.

Year	SLP	NLP	UP	State	% Change
1992	2,196	2,621	0	4,817	
1993	4,513	874	261	5,648	17.3
1994	4,818	2,075	0	6,893	22.0
1995	3,050	655	0	3,705	-46.2
1996	3,660	2,201	0	5,861	58.2
1997	3,782	2,421	0	6,203	5.8
1998	5,672	880	0	6,552	5.6
1999	3,599	2,421	1,096	7,116	8.6
2000	4,513	880	0	5,393	-24.2
2001	5,001	1,100	0	6,101	13.1
2002	5,300	913	0	6,213	1.8
2003	6,130	0	373	6,503	4.7
Average	4,353	1,420	144	5,917	6.7

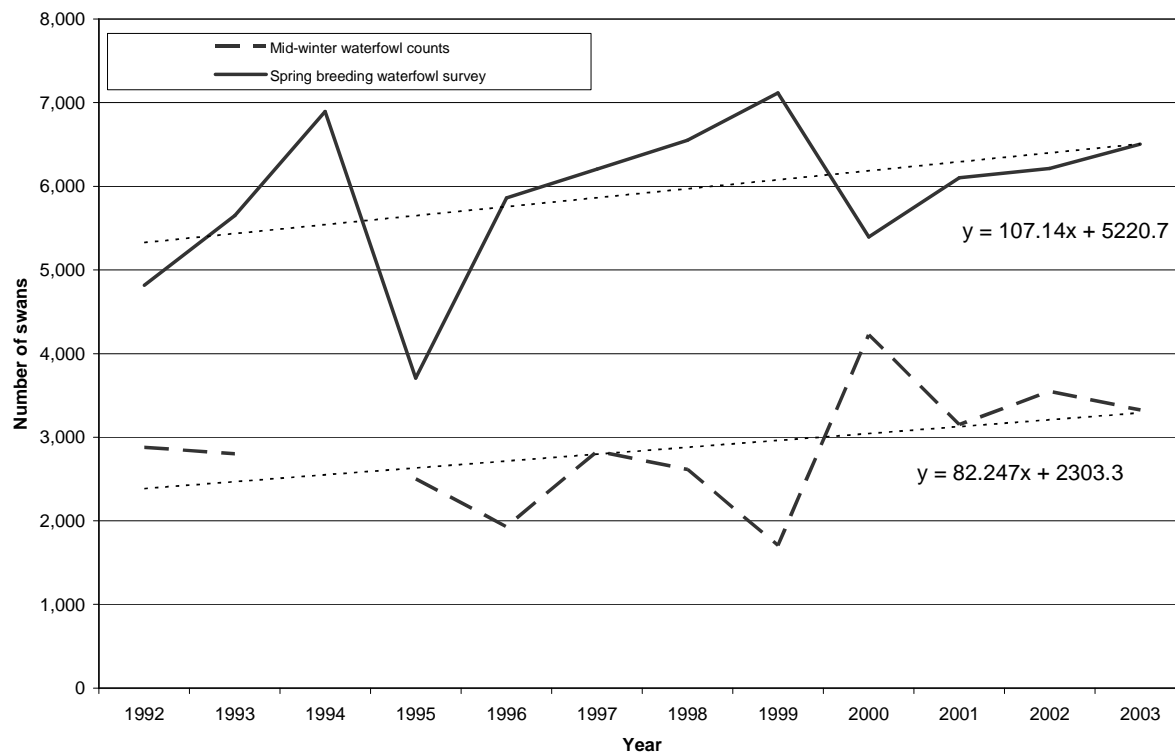


Figure 1. State swan population estimate from the Michigan breeding waterfowl survey and actual counts of mute swans at wintering locations during the Mid-winter waterfowl survey, 1992-2001. Estimates are primarily mute swans, but may include some trumpeter swans.

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